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his material, he has grouped all children as of the same age who have, *e. g.*, passed their ninth birthday and not yet reached their tenth; he has again ignored the fact that the majority of children enter school at the beginning of the year and not during the term, thus in this way still further throwing out his calculation.

G. M. WEST.

A TWO-HEADED TORTOISE.

INQUIRIES from various quarters have been made so repeatedly for the sequel to the brief story of a young two-headed tortoise, *Chrysemys picta*, published in the *American Journal of Science* for October, 1888, that the author is led to believe that a public account thereof will serve more useful ends than many private ones. In order that the sequel may be more intelligible to all, a brief resumé of the first paper will be given.

The young tortoise, hatched but a day or so, was found in the marshes bordering West River, New Haven, Conn. The carapace, which was somewhat broader than long and slightly distorted, bore the cus-

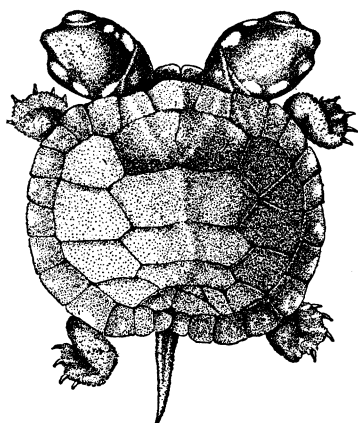


Fig. 1. Dorsal view of the two-headed tortoise *Chrysemys picta*.

tomary legs and tail, but there were two perfectly developed heads and necks.

The author visited and studied this little monstrosity almost daily for weeks. It lived and thrived and grew appreciably during that time. Its charm was in the very perfection of its imperfection. Such a oneness of two with individuality preserved is not to be found. In one carapace there were two alimentary systems, two nervous

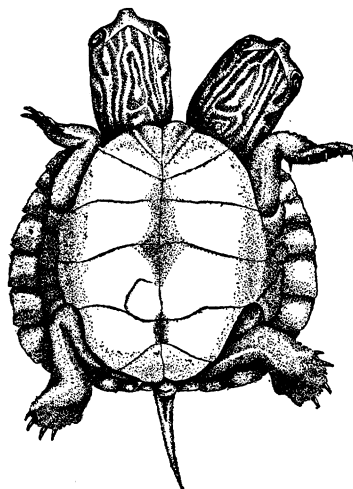


Fig. 2. Ventral view of the same.

systems, two respiratory and circulatory systems, two muscular and bony systems. Each was double in part at least. There were two wills, for the heads fought continually for the rights of their common shell and for their food.

There were two dispositions; the one quicker, more timid and more irascible; the other stolid. Each head could hear, see, eat, drink and breathe independently. Though afterwards acquired, there was originally no concerted action between the right side and the left. However, with surprising frequency, the two did act in unison, and simultaneously, as if there were correlation by a common nervous system.

They might, or they might not, each drink, sleep or swim, as each willed. When one side with its organs and appendages

slept, or was inert, the other with this dead weight as a center could but describe a circle—a course which it found endless. Here then arose a beautiful example of adaptability. It learned to drag itself sideways, wherever it would—over the whole yard. This was the right half (never the left) which has been spoken of as having a timid, quick and irascible temperament. They swam together well, but walked together awkwardly. As they walked, the fore legs acted simultaneously, so in turn the hind legs, leaving alternately the front and back of the shell without support. Thus by a slow teetering, or rocking gait, they could go where they would. In starting they almost invariably pulled persistently in opposite directions, which drew them laboriously backward three or four feet. Resting a moment, they would start together, as described above, and make the circuit of the yard.

With fate against them, they adapted themselves to their condition so admirably, and excited the admiration of so many that a false and exaggerated value was put upon them. Showmen offered sums out of all proportion to the actual value, which were rejected by the owners.

If so highly prized then it should in all consistency have been more zealously guarded. But while at large with other similar pets, a prowling cat singled out this one and pounced upon it. It was secured at once, but not before it had tumbled down the stone steps leading to the cellar.

It was returned to its aquarium, where the right head came out from its protecting shell at once; likewise the left head a half hour later. The next day it was itself again. It ate, walked and swam as usual, save the left head refused food, which was not unusual. The second day it was itself still, though the left head would take no food. On the third day it drooped. Though rallying at times and hurrying about as

usual, the left one was soon dead, as were also the left legs. The cat's claw had pierced the neck close to the shell. The distress and uneasiness of the surviving half was very apparent. All its energies and activities were redoubled, yet it died in two and one-half hours later. Up to this time its only sign of weakness was an occasional gaping as if for more air.

This little monstrosity's short life continued from the first of June to the middle of September.

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*SOME DIFFICULTIES IN THE PRESENTATION
OF THE PERIODIC LAW.*

THE Periodic Law contains so much that is true, and promises so much further revelation as to the connection between the elements and the relations of their atomic weights, valence and other properties, that its permanent position in the science is assured. It truly deserves the name of the Natural System, first given it by Mendeléeff, but abandoned because it had been used some twenty years before by Odling for a very different sort of arrangement. It stands before us to-day as the statement of a natural law, though as yet undeveloped and imperfectly understood. There can, therefore, be no question as to the acceptance of the law of the inter-dependence of the atomic weights and other properties, and the peculiar relationship of the elements now known as the Periodic Law. This must be the basis of the science, and the proper formulation of the law will contribute to a wonderful development of it in the future.

But there may well be question as to the acceptance of any of the present statements of the law. The systematic arrangements of Mendeléeff or Meyer or Bayley are all necessarily tentative because of the serious imperfections in our knowledge. There is a probability that new elements will be dis-